

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
12 November 2020 (12.11.2020)



(10) International Publication Number
WO 2020/226654 A1

(51) International Patent Classification:
G01N 9/00 (2006.01) *G01N 11/16* (2006.01)

(21) International Application Number:
PCT/US2019/031536

(22) International Filing Date:
09 May 2019 (09.05.2019)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant: MICRO MOTION, INC. [US/US]; 7070 Winchester Circle, Boulder, Colorado 80301 (US).

(72) Inventor: SMITH, Kevin F.; 3005 Ross Dr # W35, Fort Collins, Colorado 80526 (US).

(74) Agent: WHITE, Jay Michael et al.; The Ollila Law Group LLC, 2569 Park Lane, Suite 202, Lafayette, Colorado 80026 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,

OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

— with international search report (Art. 21(3))

(54) Title: DETERMINING AND IDENTIFYING ANOMALIES IN FORK METERS

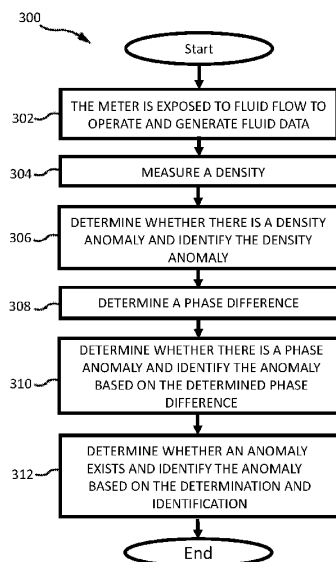


FIG.3

(57) Abstract: A method for determining a process anomaly in a fluid flow system, the system having a meter with immersed elements immersed in a fluid of a fluid flow is disclosed. The method includes determining, using a data processing circuit (132), a measured density of the fluid in the fluid flow system, determining, using the data processing circuit (132), whether the fluid flow system is experiencing a density anomaly based on a relationship between the measured density and an expected density of the fluid in the fluid flow system, determining, using the data processing circuit (132), a measured phase difference of vibrations of the immersed elements of the meter, determining, using the data processing circuit (132), whether the fluid flow system is experiencing a phase anomaly based on a relationship between the measured phase difference and a target phase difference of the vibrations of the immersed elements in the fluid flow, and identifying an anomaly of the fluid flow system based on the determination of whether there is a density anomaly and the determination of whether there is a phase anomaly.

WO 2020/226654 A1